

# MT

2018 \_\_\_ 1100

Seat No. 

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## MT - SCIENCE & TECHNOLOGY -I (72) - SEMI PRELIM - I : PAPER - 3

**Time : 2 Hours**

**(Pages 4)**

**Max. Marks : 40**

Note :

- (i) All questions are compulsory.
- (ii) Draw neat and labelled diagrams wherever necessary.

**Q.1. (A) Solve the following questions : 5**

- (1) The amount of water vapour in air is determined in terms of its .....
- (2) If one of the metal is mercury, then the alloy is known as .....
- (3) **State whether the following statements are 'True' or 'False', and explain:**  
A satellite needs a specific velocity to revolve in specific orbit.
- (4) **State whether the following statements are true or false. If false, rewrite the correct statements:**  
Two pairs of electrons are shared between two nitrogen atoms to form a nitrogen molecule.
- (5) **Match following :**

Column A		Column B	
(1)	Heat	(a)	cal/g°C
(2)	Specific heat capacity	(b)	kg/m <sup>3</sup>
		(c)	calorie

**Q.1. (B) Choose the correct alternative and rewrite the sentences : 5**

- (1) The reactivity of metals with dil.HCl in decreasing order is .....  
(a) Mg > Zn > Al > Fe    (b) Mg > Al > Zn > Fe  
(c) Fe > Zn > Al > Mg    (d) Fe > Al > Zn > Mg

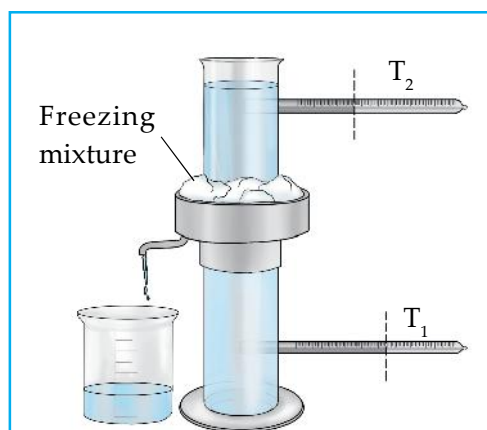
- (2) Which one of the following is a Low Earth Orbit (LEO) satellite?  
(a) Navigational satellite  
(b) Geostationary satellite  
(c) International Space Station  
(d) All of the above
- (3) If the pressure is applied on ice, its melting point .....  
(a) decreases (b) increases  
(c) remains the same (d) fluctuates
- (4) ..... are used for making fragrance and flavouring agents.  
(a) Ethers (b) Ethanol  
(c) Ester (d) Ethanoic acid
- (5) If the potential difference across a wire is 2 V and the current through the wire is 1 A, the electric power is .....  
(a) 4 W (b)  $\frac{1}{2}$  W  
(c) 2 W (d)  $\frac{1}{4}$  W

**Q.2. Solve the following questions : (Any 5)****[10]**

- (1) **Give Scientific Reason:**  
Pine oil is used in Froth floatation.
- (2) State any two effects of short circuit.
- (3) **Write structural formula for the following IUPAC name.**  
Pent - 2 - one - Molecular formula-  $C_5H_{10}O$
- (4) How can you relate the formation of water droplets on the outer surface of a bottle taken out of refrigerator with formation of dew.
- (5) **Write chemical equation for the following reaction:**  
Aluminium oxide reacts with sodium hydroxide.
- (6) **Differentiate between** : Alkanes and Alkenes
- (7) **W.r.t. medium Earth orbit answer the following :**  
(a) What is the range of the height of the orbit above the Earth's surface?  
(b) What are the applications of the Satellites placed in this orbit?

**Q.3. Solve the following questions : (Any 5)****[15]**

- (1) (a) Distinguish between AC and DC generator.  
 (b) State Fleming's Right hand rule.
- (2) Answer the following questions based on the diagram below :



- (i) When the temperature of water decreases from 4°C to 2°C will the level of water rise or fall in the cylinder?  
 (ii) Which of the two thermometers, T<sub>1</sub> or T<sub>2</sub>, will show a temperature of 0°C first?  
 (iii) Pipe lines crack in winter season in cold countries due to which phenomena?
- (3) (a) What is the commercial unit for measuring electrical Energy?  
 (b) Heat energy is being produced in a resistance in a circuit at the rate of 100 W. The current of 3 A is flowing in the circuit. What must be the value of the resistance?
- (4) (a) Identify the type of the following reaction of carbon compounds.  
 $\text{CH}_3\text{-COOH} + \text{CH}_3\text{-OH} \rightarrow \text{CH}_3\text{-COOCH}_3 + \text{H}_2\text{O}$   
 (b) Explain dehydration reaction of ethanol.
- (5) If 80g steam of temperature 97°C is released on an ice slab of temperature 0°C, how much ice will melt? How much energy will be transferred to the ice when the steam will be transformed to water?

- (6) (a) Draw a neat and labelled diagram of Magnetic separation method.  
(b) Define Minerals.
- (7) Explain with an example what is meant by substitution and addition reaction.

**Q.4. Solve the following questions : (Any 1)**

**[5]**

- (1) Describe Bayer's Process with neat labelled diagram.
- (2) What is meant by the 'orbit' of a satellite? On what basis and how are the orbits of artificial satellites classified?

**Best Of Luck** 🍀